

Response

Serial No.: 10/507,168

Confirmation No.: 2799

Filed: May 5, 2005

For: POLYMERIZATION OF A REACTIVE DILUENT IN THE PRESENCE OF AN EPOXY-AMINE
MATERIAL, AND COATING COMPOSITIONS PREPARED THEREBY

Remarks

The Office Action mailed August 11, 2008 has been received and reviewed. No claims having been added, amended, or canceled herein, the pending claims are claims 1 and 3-34.

Reconsideration and withdrawal of the rejections are respectfully requested.

Claims 1, 3-8, 11, 14-15, and 17-34 stand rejected under 35 U.S.C. §102(b) as anticipated by, or in the alternative under 35 U.S.C. §103(a), as obvious over Neumann (U.S. Patent No. 5,932,636). Claims 9 and 10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Neumann et al. (U.S. Patent No. 5,932,636). Applicants respectfully traverse these rejections.

"[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. §102." *Net MoneyIN Inc. v. VeriSign Inc.*, 545 F.3d 1359, 88 USPQ2d 1751, 1759 (Fed. Cir. 2008). "[T]he [prior art] reference must clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without *any* need for picking, choosing, and combining various disclosures not directly related to each other by the teachings of the cited reference." *Net MoneyIN Inc.*, 88 USPQ2d at 1760, quoting *In re Arkley*, 455 F.2d 586, 587, 172 USPQ 524, 526 (CCPA 1972) (emphasis in original).

Present independent claim 1 recites a method of preparing a coating composition that includes the steps of:

- combining an amine and an epoxy material in the presence of a reactive diluent including at least one methacrylate compound to provide a composition including an advanced molecular weight epoxy-amine material and a reactive diluent;
- making an aqueous dispersion of the composition; and
- polymerizing the reactive diluent to provide the coating composition.

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Claim 25 recites a coating composition prepared according to the method of claim 1, and claim 26 recites a method of coating using a coating composition prepared according to the method of claim 1. Applicants discovered that it is particularly advantageous to combine their amine and epoxy materials in the presence of a reactive diluent (thereby lessening the need for volatile solvents when making an epoxy-amine material) and that the choice of reactive diluent is particularly important during such a process (as some other known monomers, which might otherwise serve to act as a solvent and lower the reaction mixture's viscosity, would create undesirable side reactions with the amine material).

Applicants respectfully submit that Neumann does not clearly and unequivocally disclose the presently claimed invention without any need for picking, choosing, and combining various disclosures. There is no mention in Neumann of the specific combination of combining an amine and an epoxy material in the presence of a reactive methacrylate diluent to provide a composition including an advanced molecular weight epoxy-amine material and a reactive diluent.

Instead, Neumann only generally discloses making aqueous synthetic resin dispersions useful as an e-coat binder. Neumann's resin dispersions include: (A) an ionic epoxy resin; (B) a blocked polyisocyanate; and (C) a polymer of at least one olefinically unsaturated monomer which is capable of undergoing free-radical polymerization. Notably, however, Neumann's ionic resin (A) can be selected from an ionic epoxy resin that may or may not include amine. Further, the olefinically unsaturated monomers can be selected from at least five disclosed subgenera (e.g., vinyl monomers, aromatic vinyl compounds, vinyl ethers, vinyl esters, and esters of α,β -unsaturated acids), and the subgenera of α,β -unsaturated acids includes at least four disclosed species (e.g., acrylates, methacrylates, fumarates, and maleates). Even further, the olefinically unsaturated monomers may already be present during the synthesis of the amino-epoxy resin or else during the synthesis of the blocked isocyanate or are added after the synthesis thereof.

Applicants respectfully submit that Neumann fails to clearly and unequivocally disclose the presently claimed invention or direct those skilled in the art to the invention without *any* need for picking, choosing, and combining various disclosures. For example, Neumann fails to clearly

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and unequivocally disclose combining an amine and an epoxy material in the presence of a methacrylate reactive diluent.

Moreover, Applicants respectfully submit that Neumann provides insufficient guidance for one of skill in the art to arrive at the presently claimed invention.

To arrive at Applicants' invention, one would have to select without any guidance an epoxy-amine resin as the ionic resin (A); further select without any guidance at least one methacrylate compound as the reactive diluent; and even further select preparing the epoxy-amine resin in the presence of the at least one methacrylate compound. Notably, the Office Action acknowledged that it is not clear if the disclosure of Neumann is sufficiently specific "[w]ith respect to the presence of the reactive diluent during combination/reaction of the amine and epoxy materials" (page 5, lines 9-11 of the Office Action mailed August 11, 2008) or "[w]ith respect to the use of a methacrylate compound . . . as the reactive diluent" (page 5, lines 3-4 of the Office Action mailed August 11, 2008). Specifically, the Office Action noted the options "that the reactive monomer: (a) may be already present during the synthesis of the amino-epoxy resin; (b) may be already present during the synthesis of the blocked isocyanate; (c) may be added after the synthesis of the amino-epoxy resin; or (d) may be added after the synthesis of the blocked isocyanate." Nowhere does Neumann make Applicants' discovery that when the epoxy and amine are reacted together in the presence of a reactive diluent, the reactive diluent should comprise methacrylate materials.

The Office Action alleged that "the selection of technique (a) would have been obvious" because the disclosed techniques are "equivalent" (page 5, lines 13-19 of the Office Action mailed August 11, 2008). Applicants earnestly disagree, and respectfully submit that the disclosed techniques are not equivalent. For example, the technique of combining the amine and the epoxy material in the presence of a reactive diluent can offer advantages over the other techniques by allowing for the preparation of waterborne compositions that are substantially free of solvent and/or have low volatile organic compound (VOC) content (e.g., page 14, line 28 to page 15, line 12 of the present specification).

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Further, the Office Action alleged that Neumann et al. "mentions preference to methacrylate materials" and "that methacrylate materials are featured in the claims of Neumann et al." (page 6, lines 10-12 of the Office Action mailed August 11, 2008). Applicants respectfully submit that neither of these allegations is entirely accurate. In fact, Neumann et al. state that "[p]reference is given to the use of *acrylic or methacrylic* esters of monoalcohols which contain 1 to 18 carbon atoms, preferably n-butyl *methacrylate*, methyl *methacrylate*, isobutyl *acrylate*, 2-ethylhexyl *acrylate* and, in particular, butyl *acrylate*" (column 10, lines 7-11; emphasis added). In fact, Neumann et al. provide absolutely no guidance for one of skill in the art to select *methacrylate monomers* over *acrylate monomers*. Moreover, only "*(meth)acrylate*" materials, which is the conventional abbreviation for *acrylate* and/or *methacrylate* materials, are recited in the claims (i.e., claim 16).

Notably, Applicants have discovered that when combining an amine and an epoxy material in the presence of a reactive diluent (e.g., claim 1), *acrylate* compounds are ***not preferred*** as reactive diluents, because acrylate monomers may be reactive in the presence of an amine and an epoxy material. Accordingly, the present specification makes clear that " 'reactive diluent' refers to monomers and/or oligomers that are substantially non-reactive with the epoxy material and/or amine under the conditions used to prepare the epoxy-amine material" (page 6, lines 29-31 of the present specification).

The Office Action further noted that "the claims do not explicitly exclude the use of acrylate monomers" (page 15, lines 3-4 of the Office Action mailed August 11, 2008). Applicants agree. However, whether Applicants' claims positively exclude an ingredient is not the proper focus. Rather, the present claims positively recite that a particular selection be made, i.e., to use a methacrylate material. Therefore, as the prior art fails to disclose or suggest this selection the rejection must be reversed.

For at least this reason, Applicants respectfully submit that independent claim 1 and its dependent claims 3-11, 14-15, 17-24, and 30-34 are not anticipated or rendered obvious by Neumann. For similar reasons, Applicants respectfully submit that a coating composition

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prepared according to the method of claim 1 (e.g., claim 25) and methods of coating using a coating composition prepared according to the method of claim 1 (e.g., claims 26-29) are not anticipated or rendered obvious by Neumann. Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §§102 and 103.

Claims 1 and 3-34 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Bremser (U.S. Patent No. 6,201,043). Applicants respectfully traverse the rejection.

The Office Action admitted that Bremser fails to disclose all of the subject matter of claims 1 and 5:

"Bremser et al. fail to disclose the step of: (1) combining an amine and an epoxy material *in the presence of* a reactive diluent comprising at least one methacrylate compound; (5) wherein the epoxy material is dissolved or dispersed in the reactive diluent. Rather, they introduce the reactive diluent after forming the epoxy-amine adduct." (Page 10, lines 12-15 of the Office Action mailed 15 February 2008; emphasis in original).

Applicants agree.

Further, Applicants presented arguments in the Response submitted May 15, 2008 that combining an amine and an epoxy material in the presence of a reactive diluent can lead to results that are advantageous over introducing a reactive diluent after forming the epoxy-amine adduct (page 5, line 15 to page 6, line 20 of the Response submitted May 15, 2008, which is incorporated herein by reference). The Office Action mailed August 11, 2008 acknowledged and summarized Applicants' arguments that (a) this technique is a solution to solve the problem of using *excess* organic solvent; (b) this technique can allow for the preparation of waterborne *coating* compositions that are substantially free of solvent and/or have low volatile organic compound content; and (c) that Bremser et al. use substantial amounts of solvent in their preparation technique, as indicated by solids content. (Page 15, lines 12-18 of the Office Action mailed August 11, 2008). Again, Applicants agree.

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Nonetheless, the Office Action noted that "only claims 20 and 22 address the presence of solvent" (page 15, lines 19-20 of the Office Action mailed August 11, 2008). Applicants do not entirely understand the intent of this statement. However, to the extent that this statement implies that all the advantageous results achieved by methods and compositions of the present claims must be recited in the claims, Applicants earnestly disagree. In the event that the present rejection is maintained, Applicants respectfully request an explanation along with supporting authority for any such implication.

Applicants respectfully request that the advantageous results presented herein be considered for their intended purpose of rebutting the assertion made in the Office Action mailed February 15, 2008, and repeated in the Office Action mailed August 11, 2008:

It should be noted that the limitations of the instant invention represent a change in order of process steps. In light of this, it has been found that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. It has also been found that the selection of any order of mixing ingredients is *prima facie* obvious in the absence of new or unexpected results - *see MPEP 2144.04 IV C.*" (Page 11, lines 18-22 of the Office Action mailed August 11, 2008).

Applicants respectfully request that the advantageous results presented herein (e.g., allowing for the preparation of waterborne coating compositions that are substantially free of solvent and/or have low volatile organic compound content) be fully considered for their intended purpose of rebutting the above-recited assertion. Further, Applicants respectfully submit that the embodiment described in dependent claim 20 (wherein the coating composition further includes a solvent) does not "run counter" to the cited advantages as alleged in the Office Action mailed August 11, 2008 (page 15, lines 20-22), for example, because a method or composition that includes a solvent (e.g., a small amount of solvent) does not detract from the capability of the presently claimed method to prepare waterborne coating compositions that are substantially free of solvent and/or have low volatile organic compound content.

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Finally, in referring to Bremser, the Office Action noted that "the solvent technique further involves the steps of neutralization and conversion to an aqueous solution/dispersion. . . . This aqueous solution/dispersion is further diluted with water to form an aqueous coating composition" (page 16, lines 3-6 of the Office Action mailed August 11, 2008). Applicants agree with this notation. However, the Office Action went on to assert that "[a]lthough the amine/epoxy reaction may take place in the presence of solvent, the final aqueous *coating composition* is diluted with water to such and [sic] extend [sic] that the final solvent content does not appear to be significant" (page 16, lines 6-9 of the Office Action mailed August 11, 2008; emphasis in original). Applicants earnestly disagree, and respectfully submit that *the Office Action misapprehended the meaning of waterborne coating compositions that have low volatile organic compound content.*

The present specification clearly defines the meaning of volatile organic compound (VOC) content:

As used herein, "volatile organic compound" ("VOC") refers to any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. Typically, volatile organic compounds have a vapor pressure equal to or greater than 0.1 mm Hg. As used herein, "volatile organic compound content" ("VOC content") means *the weight of VOC per volume of the coating solids*, and is reported, for example, as kilograms (kg) of VOC per liter. (Page 4, lines 1-9 of the present specification; emphasis added).

In brief, VOC content is defined as the weight of VOC per volume of the *coating solids*.

Coating solids are also clearly defined in the present specification:

[T]he terms "coating solids" and "coating solids component" refer to the sum of the mass of components used in the composition (e.g., epoxy-amine material, reactive diluent, epoxy material, and

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any other reactive curing agents, reactive diluent components, or initiators that are employed), *exclusive of water or organic solvent*. (Page 3, lines 12-16 of the present specification; emphasis added).

Thus, in view of the above-referenced definitions of VOC content and coating solids, Applicants respectfully submit that it would be abundantly clear to one of skill in the art that, contrary to the allegation in the Office Action, dilution of a coating composition with water would not render solvent content insignificant.

For at least these reasons, Applicants respectfully request full and appropriate consideration of the advantageous results discussed herein, and respectfully submit that a *prima facie* case of obviousness for claims 1, 3-24, and 30-34 being unpatentable over Bremser et al. has not been established. For similar reasons, Applicants respectfully submit that a *prima facie* case of obviousness for claim 25 (i.e., a coating composition prepared according to the method of claim 1) and claims 26-29 (i.e., methods of coating using a coating composition prepared according to claim 1) being unpatentable over Bremser et al. has not been established.

Claims 12, 13, and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Neumann et al. (U.S. Patent No. 5,932,636) in view of Bremser et al. (U.S. Patent No. 6,201,043). Applicants respectfully traverse the rejection.

Claims 12, 13, and 16 depend directly or ultimately from claim 1. The deficiencies of Neumann with respect to claim 1 have been discussed herein above. For example, Neumann fails to clearly and unequivocally disclose or suggest, among other things, combining an amine and an epoxy material in the presence of a methacrylate reactive diluent.

Because Bremser also fails to teach or suggest combining an amine and an epoxy material in the presence of a methacrylate reactive diluent, Applicants respectfully submit that Bremser fails to remedy the deficiencies of Neumann.

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For at least this reason, Applicants respectfully submit that a *prima facie* case of obviousness for claims 12, 13, and 16 being unpatentable over Neumann in view of Bremser has not been established.

Reconsideration and withdrawal of the rejections under 35 U.S.C. 103(a) are respectfully requested.

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Summary

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives at the telephone number listed below if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted

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CERTIFICATE UNDER 37 CFR §1.8:

The undersigned hereby certifies that this paper is being transmitted via the U.S. Patent and Trademark Office electronic filing system in accordance with 37 CFR §1.6(a)(4) to the Patent and Trademark Office addressed to the Commissioner for Patents, Mail Stop Amendment, P.O. Box 1450, Alexandria, VA 22313-1450, on this 11th day of December, 2008.

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